

The Influencing Factors and Mitigation Strategies of Seafarer Job Burnout

-- A Study based on SEM and fsQCA

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Abstract

Purpose: The purpose of this study is to investigate the causes of seafarer burnout and the complex combination of causes that inspire burnout, and to provide a theoretical basis for mitigating seafarer burnout. **Methods:** This study used questionnaire method to survey 451 seafarer members. Then, the questionnaire data were statistically analyzed using SPSS26.0 software, and the job burnout influencing factors were explored by structural equation modeling using AMOS24.0. Third, a qualitative comparative analysis is used to explore the combination of factors that stimulate job burnout. **Methods:** The results of structural equation modeling showed that seafarer members' subjective well-being, general self-efficacy, and psychological resilience genera are all significantly negatively related to job burnout. Job demands are significantly negatively related to job burnout, job control negatively affects the decreased personal accomplishment dimension, and social support negatively affects the depersonalization and emotional exhaustion dimensions. Then, this study conducted a fuzzy-set qualitative comparative analysis based on these six burnout influencing factors, and the results show that there are no necessary conditions leading to job burnout among the six antecedent variables and that there existed four combinations of conditions with high explanatory power for the formation of burnou. Finally, based on the findings of the study to alleviate seafarer burnout to provide management recommendations.

Keywords

Job Burnout; Influencing Factors; Structural Equation Modeling; Fuzzy-set Qualitative Comparative Analysis.

1. Introduction

Since New York clinical psychologist Freudenberger first proposed the concept of burnout in 1974, the issue of burnout has received widespread attention [1]. According to Maslach and Jackson's definition, burnout is a state of exhaustion of feelings, emotions, and behaviors resulting from prolonged high work intensity, which is manifested by emotional exhaustion, depersonalization, and reduced sense of personal accomplishment [2]. Current research on burnout focuses on doctors, nurses, teachers, and other groups, and there are fewer studies on burnout in seafarers. Different occupations have different characteristics, and the characteristics of maritime work include irregular working hours, harsh working environment, and isolation caused by long voyages, which easily lead to the phenomenon of job burnout.

seafarer burnout has different degrees of negative impacts on themselves, enterprises, and society. Burnout has a direct negative impact on the physical and mental health of individual seafarer members. Long-term work pressure and fatigue may lead to anxiety, depression, physical discomfort, and other problems. For organizations, burnout issues may lead to increased employee turnover. In addition, burnout can reduce an individual's performance and efficiency at work. Employees in a state of burnout may have difficulty concentrating, making good decisions, and may be less motivated to work, which can negatively affect the overall performance of the organization as well as the safety of ship navigation. An in-depth study of the causes of seafarer burnout can help to develop more scientific and effective management strategies to improve employees' job satisfaction and health, thus providing a guarantee for the safety of ship navigation.

This study takes the seafarer as the survey object for experimental design. Based on extensive literature research, research questionnaires are designed, and experimental data are collected. Then, this study explores the influence factors of seafarer burnout by constructing structural equation modeling. To further study the relationship between the research variables, this study adopts fuzzy-set qualitative comparative analysis (fsQCA) based on structural equation modeling to deeply analyze how a series of combined causal conditions affect burnout.

2. Research Basis and Model Design

With the current accelerated pace of life, the problem of burnout exists in different occupations. The emergence of the burnout phenomenon has different degrees of impact on individuals, organizations, and society. Therefore, exploring the causes of burnout and alleviating the phenomenon of burnout in individuals has been a popular research topic among scholars. This study focuses on occupational characteristics, organizational characteristics, and individual characteristics to investigate the causes of burnout among seafarers.

Concerning seafarer members' occupational and organizational characteristics, this study focuses on seafarer members' job requirements, job control, and social support. The relationship between job characteristics and job stress has long been recognized by scholars. Therefore, the job demand-control model was proposed by Karasek in 1979 [3]. Karasek used the JDC model to describe the effects of job characteristics on individual well-being and health. Afterward, social support was included in the JDC model as an organizational characteristic, resulting in the JDCS (Job Demands-Control-Support) model [4, 5]. In this context, job demands refer to the factors in the job that cause stress and burden on the individual, including workload, time pressure, and psychological pressure. These demands may have negative physical and psychological effects on the individual. Job Control is defined as the decision-making freedom and control that an individual has at work. High Job Control means that employees are able to make decisions at work, while low Job Control means that individuals are more restricted in what they can do and how they can do it. Social support is defined as support from co-workers, superiors, organization or family, and interpersonal relationships at work. Social support can alleviate work stress and improve an individual's psychological well-being and job satisfaction. Several studies have examined the main effects of JDCS variables on burnout dimensions. Related studies have shown that job demands are a stronger predictor of the Emotional Exhaustion and Depersonalization dimensions than job control, but job demands are a weaker predictor of the Personal Underachievement dimension than job control. Social support affects all three dimensions of burnout to varying degrees [6, 7]. There is a positive correlation between high levels of job demands and decreased personal accomplishments. When high job control and high job demands occur simultaneously, individuals are able to deal with job demands to reduce their job stress and enhance their accomplishment [8, 9, 10]. Wu et al. verified that high job demands, low job control, and low social support lead to burnout by taking

hotpot restaurant employees as the research subjects and using burnout as the dependent variable [11]. Maria used disability support workers as the research object and verified the interaction effect of job requirements, job control, and social support on burnout [12]. Therefore, this study proposes hypotheses based on the JDCS theory to investigate the effects of seafarer members' occupational characteristics and organizational characteristics on burnout.

Regarding the influence of individual characteristics on burnout, three variables, subjective well-being, general self-efficacy, and psychological resilience, were selected to be investigated in this study. Subjective well-being is an important indicator of our quality of life and psychological health. Tong pointed out that subjective well-being refers to people's subjective feelings about whether they are happy or not, and it is one of the important indicators of psychological health [13]. At present, there are fewer studies on the relationship between the effects of burnout and subjective well-being among seafarer members. However, the negative influence relationship between the two has been proved in other occupations [14, 15, 16]. Bandura (1977,1997) defined self-efficacy as people's belief in their ability to produce desired effects through their actions [17, 18]. Shoji verified the relationship between general self-efficacy and burnout in different occupations in different countries. The strength of the relationship between the two influences differed depending on factors such as the occupation and age of the participants [19]. Bentea confirmed that teacher self-efficacy was significantly related to teacher burnout and well-being dimensions [20]. Chang et al. conducted a study with nurses and the results showed that higher general self-efficacy and social support would reduce burnout among nurses [21]. Regarding the influential relationship between burnout and psychological resilience, some scholars have demonstrated a negative influential relationship between the two [22, 23, 24].

Based on the above research foundation, this study utilizes structural equation modeling to explore the factors affecting burnout among seafarer members. Specifically, subjective well-being, psychological resilience, and general self-efficacy are used as independent variables to construct model 1, with job burnout as the dependent variable, and job demands, job control, and social support are used as independent variables to construct model 2 with burnout as the dependent variable, after which fsQCA is used to explore the complex combinations of causes among the factors affecting burnout.

3. Research Subjects and Methods

3.1. Research Subjects

This study was conducted from May 10, 2023, to September 16, 2023, using a random sampling method to survey seafarers. A total of 451 questionnaires were distributed, and 427 valid questionnaires were collected, with an effective recovery rate of 94.7%.

3.2. Research Tools

This study employed a questionnaire survey method, with the questionnaire primarily divided into participant basic information and research scales. Basic information included age, maritime experience, marital status, educational level, family status, position, and working navigation area. The scales selected for this study included the Maslach Burnout Inventory General Survey (MBI-GS), the Connor-Davidson Resilience Scale (CD-RISC), and the Subjective Well-Being Scale.

3.2.1. Maslach Burnout Inventory General Survey (MBI-GS)

The MBI-GS adopts a Likert 7-point scale, with 0 indicating "Never" and 6 indicating "Very Frequently." The inventory comprises three parts: Emotional Exhaustion, Depersonalization, and Reduced Personal Accomplishment. Emotional Exhaustion consists of 5 items,

Depersonalization consists of 5 items, and Reduced Personal Accomplishment consists of 6 items, making a total of 16 questions[25]. The six items in the Reduced Personal Accomplishment dimension are scored in reverse. The Cronbach's Alpha coefficient for this inventory is 0.876.

3.2.2. Connor-Davidson Resilience Scale (CD-RISC)

The CD-RISC, developed by Connor and Davidson in 2003, aims to assess individuals' levels of psychological resilience. CD-RISC consists of 25 items, and in this study, the three-dimensional classification by Zhang and Yu is used, dividing psychological resilience into Resilience, Strength, and Optimism[26]. Each item in CD-RISC uses a 5-point Likert scale, ranging from 0 (Never) to 4 (Almost always) for scoring. The overall psychological resilience score can be calculated based on the scores of each item, where a higher score indicates better psychological resilience[27]. The Cronbach's Alpha coefficient for this scale is 0.955.

3.2.3. Subjective Well-being Scale

The Subjective Well-being Scale consists of three parts: the Quantity of Happiness Scale, the Emotional Scale, and the Life Satisfaction Scale[28]. The Quantity of Happiness Scale, developed by Campbell (1976), includes two parts: Overall Emotional Index and Life Satisfaction. The Emotional Index comprises 8 items, and Life Satisfaction comprises 1 item. The scale uses a 7-point Likert scale, and the final score is the sum of the average score of the Emotional Index and the Life Satisfaction score (weighted by 1.1)[29]. The Emotional Scale, developed by Bradburn (1969), consists of Positive Emotions and Negative Emotions, each containing five items. Participants score one point for each positive item selected and each negative item not selected, with the final score being the sum of positive and negative item scores plus 5[30]. The Life Satisfaction Scale, developed by Diener (1985), includes 5 items and uses a seven-point Likert scale, where 1 represents "Strongly Disagree," and 7 represents "Strongly Agree." A higher score indicates higher life satisfaction[19]. The Cronbach's Alpha coefficient for this scale is 0.914.

3.2.4. Job Demands Scale

Job Requirements Scale Job requirements were measured using the Job Requirements Scale compiled by Karasek (Karasek, 1979), which contains 7 items to measure psychological stress such as workload, time pressure, etc. The Likert 5-point scale was used, with 1 representing "very small", 5 representing "very much", with higher scores representing more demanding work [32, 33]. The Cronbach's alpha coefficient for this scale is 0.884.

3.2.5. Job Control Scale

The measurement of job control refers to the Job Control Scale developed by Ma Jianhong (1999), which mainly contains two dimensions of the sense of control and job desire, with a total of 13 items, using a Likert 5-point scale, with 1 standing for "very small" and 5 stands for "very large". The Likert 5-point scale was used, with 1 representing "very small" and 5 representing "very large". The sense of job control contains 8 items and the desire for control contains 5 items, with higher ratings representing more demanding jobs [34, 35]. The Cronbach's alpha coefficient for this scale is 0.937.

3.2.6. Job Support Scale

The measurement of job support refers to the Job Support Scale developed by Caplan et al. (Caplan, 1975), which mainly describes the degree to which subjects feel support from coworkers, supervisors, family, and friends. The scale consists of six items and is based on a 5-point Likert scale, with 0 representing "not at all" and 5 representing "completely" [36]. The Cronbach's alpha coefficient of the scale was 0.918.

3.3. Research Methodology

In this study, SPSS 24.0 software was used for descriptive statistics and correlation analysis of the data, and Amos 24.0 was used to construct structural equation modeling with a test level (α) of 0.05.

4. Data Analysis and Results

4.1. PLS-SEM Analysis

In this study, partial least squares structural equation modeling is used to explore the influencing factors of seafarer job burnout. Model 1 selected three individual characteristic variables of subjective well-being, psychological resilience, and general self-efficacy as independent variables and three dimensions of burnout as dependent variables. The final fit of Model 1 is shown in Figure 1, where X1 is defined as subjective well-being, X2 as psychological resilience, X3 as general self-efficacy, and Y1, Y2, and Y3 are defined as emotional exhaustion, depersonalization, and low achievement, respectively. Based on the JDCS theory, Model 2 is developed. Model 2 used job demand, job control, and social support as independent variables and the three dimensions of job burnout as dependent variables. By deleting the insignificant paths in Model 2, the final model fit is shown in Figure 2, where X4 is defined as job requirements, X5 is defined as job control, and X6 is defined as social support. Each specific fitness fitting index of Model 1 and Model 2 is shown in Table 1, which shows that the model fitting effect is better.

Table 1. Fit Indices of the Structural Equation Model

Indicators	Absolute Fit Indices		Incremental Fit Indices			Parsimonious Fit Indices	
	X ² /df	RMSEA	IFI	TLI	CFI	PCFI	PNFI
Specific Categories	X ² /df	RMSEA	IFI	TLI	CFI	PCFI	PNFI
Evaluation Criteria	<5	<0.08	>0.9	>0.9	>0.9	>0.5	>0.5
Model 1 Fit Indices	2.576	0.061	0.932	0.925	0.932	0.851	0.816
Model 2 Fit Indices	1.958	0.76	0.903	0.891	0.902	0.813	0.739

The results of the path coefficients of Model 1 are shown in Table 2. According to Table 2, it can be concluded that the negative influence of subjective well-being on the three dimensions of burnout is significant, and the standardized path coefficients are -0.321, -0.265, and -0.298 (P<0.001). The negative effect of psychological resilience on the three dimensions of burnout was significant, with standardized path coefficients of -0.376, -0.287, and -0.208 (P<0.05), respectively. The negative effect of self-efficacy on the depersonalization dimension was significant with a standardized path coefficient of -0.128 (P=0.05). The negative effect of self-efficacy on the dimension of emotional exhaustion was not significant. The negative effect of self-efficacy on the dimension of low achievement was significant with a standardized path coefficient of -0.165 (p=0.019).

The results of model 2 path coefficients are shown in Table 3. According to Figure 2 and Table 3, it shows that social support negatively predicts the depersonalization dimension (β =-0.548; P<0.001); social support negatively predicts the emotional exhaustion dimension (β =-0.563; P<0.001); social support is not significant in the prediction of the decreased personal accomplishment dimension (P>0.05); job control is not significant in the prediction of the depersonalization and emotional exhaustion dimension (P>0.05); job control significantly negatively predicted the decreased personal accomplishment dimension (β =-0.341; P<0.001); job demands significantly positively predicted the depersonalization dimension (β =0.251; P=0.004); job demands significantly positively predicted the emotionally draining dimension (β =0.355; P<0.001); and job demands significantly negatively predict the achievement depletion dimension (β =-0.199; P=0.033).

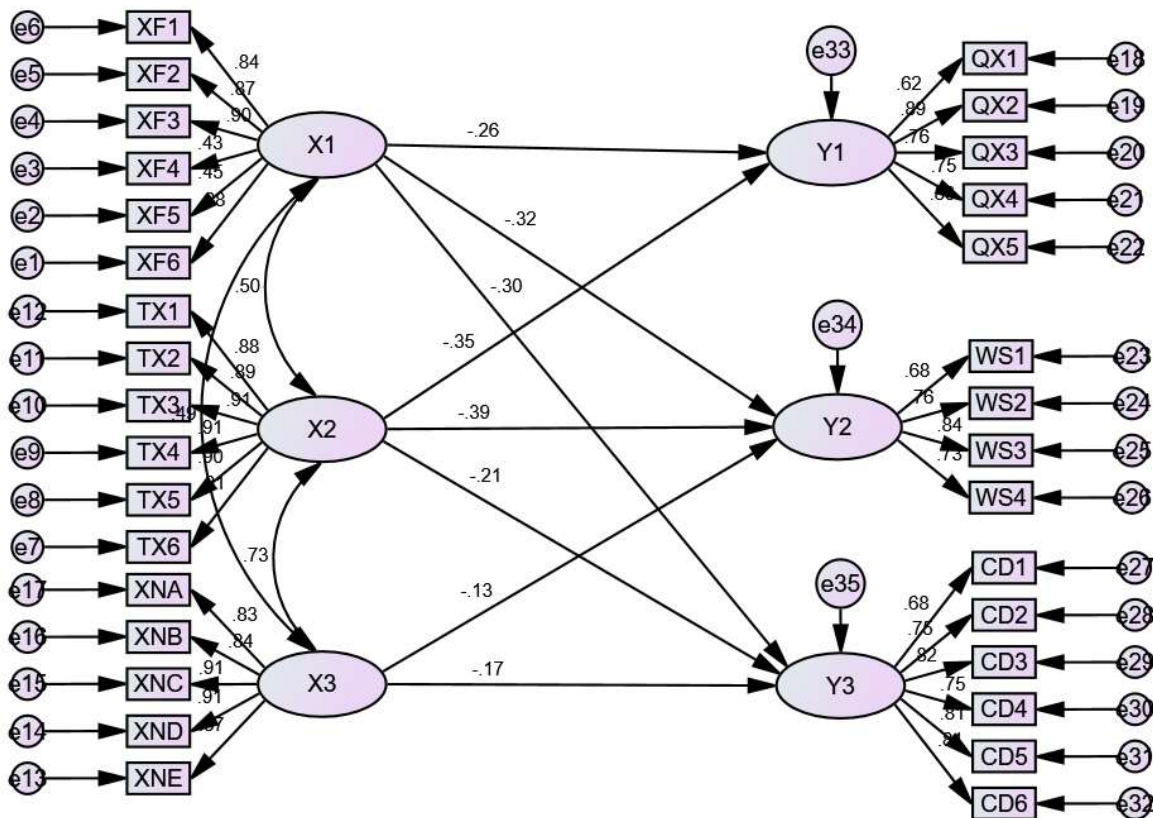


Figure 1. Model 1 structural equation modeling diagram diagram

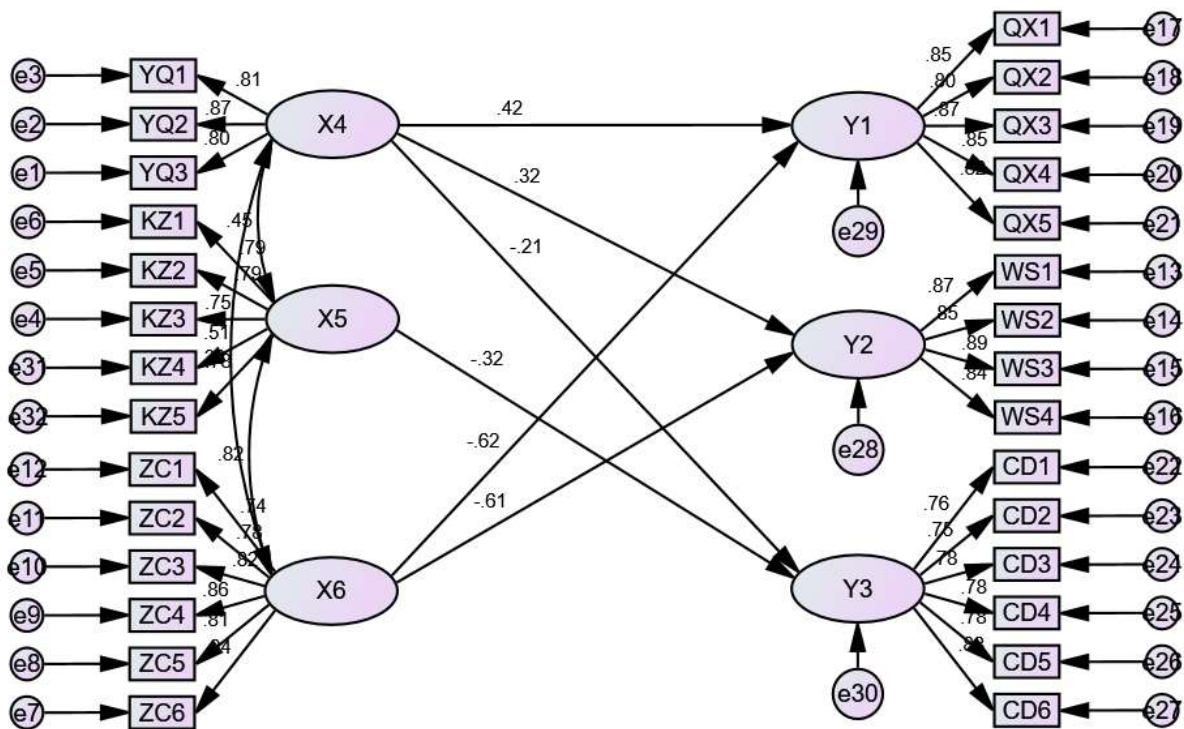


Figure 2. Model 2 structural equation modeling diagram diagram

Table 2. Model 1 Structural Equation Path Coefficients

Path	S.E.	C.R.	Std. Estimate	P-value
Depersonalization <--- Subjective Well-being	.066	-5.733	-0.321	***
Emotional Exhaustion <--- Subjective Well-being	.069	-4.271	-0.265	***
decreased professional self-efficacy<--- Subjective Well-being	.063	-5.067	-0.298	***
Depersonalization <--- Self-efficacy	.150	-1.963	-0.128	0.05
decreased professional self-efficacy<--- Self-efficacy	.147	-2.339	-0.165	0.019
Depersonalization <--- Psychological Resilience	.106	-5.517	-0.389	***
Emotional Exhaustion <--- Psychological Resilience	.112	-3.998	-0.345	***
decreased professional self-efficacy<--- Psychological Resilience	.098	-3.005	-0.215	0.003
** define as P<0.05; *** define as P< 0.01; **** define as P<0.001				

Table 3. Model 2 Structural Equation Path Coefficients

Path	S.E.	C.R.	Std. Estimate	P-value
Depersonalization<---Social support	0.149	-6.138	-0.548	***
Emotional Exhaustion<---Social support	0.133	-6.301	-0.563	***
decreased professional self-efficacy<---job control	0.17	-3.509	-0.341	***
Depersonalization<---job demand	.197	2.900	0.251	0.004
Emotional Exhaustion<--- job demand	0.178	4.056	0.355	***
decreased professional self-efficacy<---job demand	0.181	-2.005	-0.199	0.033

4.2. fsQCA Analysis

4.2.1. Variable Selection and Calibration

Burnout is often not caused by a single factor independently, and the cause of burnout is the result of the combined effect of multiple factors. Traditional linear causality analysis is difficult to provide comprehensive and reasonable analysis results. Therefore, in this study, psychological resilience, general self-efficacy, subjective well-being, job requirements, job control, and social support are used as six antecedent variables. The influential relationship between the six antecedent variables and seafarer job burnout has been verified in structural equation modeling.

Because of the order of magnitude difference between different variables, threshold calibration of the variables is needed after determining the condition variable and the outcome variable. Performing data calibration is the process of transforming the raw data into pooled affiliation scores. There are usually two types of data calibration, the direct calibration method, and the indirect calibration method, The direct calibration method is chosen to calibrate the data in this study. The raw data scores for the antecedent and outcome variables are first calculated, and then the variable anchor points (quartiles) are calculated. The three anchor points (full affiliation, crossover point, and full non-affiliation) are selected concerning the treatment of Du et al. 95%, 50%, and 5%, respectively [37].

4.2.2. Necessity Analysis

This study used fsQCA4.1 software to analyze the necessity of condition variables. The results of the necessity analysis of the condition variables in this study are shown in Table 4. Table 4 shows the consistency of the single influencing factors of seafarer burnout is less than 0.9, and there is no necessary factor that leads to burnout. Therefore, it is necessary to further explore the role of multifactorial grouping.

Table 4. Necessity Analysis of Single Influencing Factors of Seafarer Burnout

Variable	Consistency	Coverage
psychological resilience	0.784443	0.817269
~psychological resilience	0.56507	0.570695
general self-efficacy	0.710788	0.802081
~general self-efficacy	0.655893	0.616557
subjective well-being	0.736647	0.728235
~subjective well-being	0.615727	0.656126
Job demand	0.682281	0.682425
~Job demand	0.641692	0.675329
job control	0.523315	0.779479
~job control	0.817401	0.639287
social support	0.720963	0.822413
~social support	0.640102	0.596367

Note: "~" means non-set, i.e., the condition does not exist or is at a low level

4.2.3. Sufficiency Analysis

During the analysis, there are logical residuals, i.e., configurations that lack empirical examples, which can be included in the Boolean minimization. Therefore, a consistency threshold and a frequency threshold need to be set. In this study, the consistency threshold is set as 0.8 and the frequency threshold is set as 2 concerning Ragain's recommendation [38]. When the conditional grouping consistency in the truth table is greater than 0.8 the result is 1, Otherwise 0. After that, the threshold of PRI is set to 0.6, and the conditional grouping PRI value is greater than 0.6 assigned to 1, Otherwise 0 [39]. After the intermediate and complex solutions are obtained based on the truth table, "●" is defined as the core condition exists, and "⊗" is defined as the core condition does not exist; a blank indicates that the condition can either exist or absent; "●" is defined as the presence of marginal conditions; "⊗" is defined as the absence of marginal conditions [38]. The final results of the combined constructs of the factors influencing seafarer burnout are obtained as shown in Table 5. The overall coverage in the table indicates the extent to which the results can be explained by all groupings. The overall coverage is 0.899238, indicating that the four paths obtained can explain about 89.92% of the phenomenon of seafarer burnout. The overall consistency of the solution is 0.791298. The details of the four pathways are as follows:

Table 5. Configuration combination of influencing factors of seafarer burnout

variable	The combination configuration of influencing factors			
	Group 1	Group 2	Group 3	Group 4
psychological resilience	⊗	⊗	⊗	⊗
general self-efficacy	⊗		⊗	⊗
subjective well-being		●	⊗	●
Job demand		●	●	●
job control	⊗	⊗	⊗	
social support	⊗	⊗	⊗	
Original coverage rate	0.512938	0.329612	0.428318	0.341193
Unique coverage rate	0.057074	0.0162773	0.0342237	0.0278589
Consistency	0.91189	0.896933	0.936573	0.907829
Overall consistency	0.791298			
Overall Coverage	0.899238			

Note: ● means that the core condition exists, ⊗ means that the core condition does not exist; blank indicates that the condition can exist or not exist; ● indicates the existence of edge conditions; ⊗ means that the edge condition is missing.

Group 1: The core conditions are psychological resilience, general self-efficacy, and social support, and the borderline condition is job control. Group 1 explains approximately 51.29% of the high burnout sample. This group suggests that the phenomenon of seafarer burnout arises due to lower psychological resilience, lower general self-efficacy, and lower social support and job control. This grouping pattern had no requirement for the conditioning variables of subjective well-being and job demands.

Group 2: The core conditions are psychological resilience, subjective well-being, and social support. Group 2 explains approximately 32.96% of the high burnout sample. This grouping suggests that seafarer burnout occurs due to low levels of psychological resilience, high levels of subjective well-being, and low levels of social support along with high job demands and low job control. The general self-efficacy of the sample was not required for this grouping.

Group 3: The core conditions are psychological resilience, general self-efficacy, subjective well-being, and social support, and the borderline conditions are job demands and job control. Group 3 explains approximately 42.83% of the high burnout sample. This Group indicates that high job demands and low job control lead to burnout when seafarers have low psychological resilience, general self-efficacy, subjective well-being, and social support.

Group 4: The core conditions are psychological resilience, general self-efficacy, and subjective well-being, and the borderline condition is job demands. Group 4 explains approximately 34.12% of the high burnout sample. This grouping pattern suggests that when seafarer members have low psychological resilience and general self-efficacy and high job demands, even if subjective well-being is high, it will lead to job burnout.

4.2.4. Robustness Test

After obtaining the construct combinations of the factors influencing seafarer burnout, the results obtained need to be further tested for robustness. In this study, the method proposed by Schneider and Wagemann was used to conduct the robustness test. This is implemented by changing the calibration, changing the consistency threshold, or adding or deleting samples for testing [40]. In this study, the consistency threshold was adjusted from 0.8 to 0.9 in line with the previously obtained results. Then, 80% of the original sample size is randomly selected for re-analysis, and the results obtained differed very little from the initial results. The grouping obtained by both tests is consistent with the initial results, indicating that the robustness of the results is good.

5. Discussion

In 2017, the UK P&I (protection and indemnity) Club found that the risk of suicide among seafarers can be gravely dangerous, ranking second in the list of occupations. However, there are few empirical studies on the working state and mental health of seafarers. In this study, structural equation modeling and fsQCA are used to analyze the causes of seafarer burnout. The results of structural equation modeling showed that all six independent variables have different degrees of influence on job burnout. fsQCA showed that psychological resilience, general self-efficacy, subjective well-being, and social support are important core conditions.

seafarers' subjective well-being, general self-efficacy and psychological resilience are positive psychological emotions [41]. All three variables are significantly negatively correlated with burnout. Individuals' responses to problems in their careers mainly include convergent strategies (e.g., facing the problem or seeking external help) and avoidance strategies (e.g., avoidance or denial), and positive personality helps individuals adopt convergent strategies [42]. Psychological resilience is the ability of an individual to cope positively in the face of difficulties, which allows the individual to recover to a good state, and it is a protective personality trait. Self-efficacy is the ability of an individual to believe that he or she can cope well in the face of difficulties [43]. These two personality traits help individuals to cope

positively with various difficulties and emergencies encountered at work, which in turn leads to lower emotional exhaustion at work, higher personal fulfillment, and lower burnout. Several studies have been conducted to show that these positive personality traits can be enhanced through human intervention, and that organizations can alleviate burnout by enhancing the positive personality traits of seafarers [44][45].

Model 2 shows that job demands, job control, and social support all significantly influenced seafarer burnout. Among them, there is a high correlation between job requirements and all three dimensions of burnout. Excessive job demands can cause physical and psychological stress to individuals, which in turn leads to burnout. There was a high correlation between job control and low achievement, which suggests that seafarer members' low control over their jobs can directly lead to low achievement, which is consistent with previous research [46]. It has also been shown that positive social environments and servant leadership can be effective in reducing burnout, i.e., support from leaders, coworkers, family, and the community significantly reduces burnout, which is consistent with the findings of this study [47] [48]. When the support and job control that an individual receives from the organization and society cannot meet the requirements of the job it leads to burnout. Therefore, enterprises and managers should pay more attention to the match between seafarer members' work requirements and work control, understand seafarer members' needs and work difficulties, and give them more care and work support. Individuals should also communicate with their family members and colleagues to reduce their burnout.

According to fsQCA, it shows that group 1 and group 3 can explain most of the high burnout population. These two groupings show that when the individual's psychological characteristics are characterized by lower psychological resilience, general self-efficacy, and subjective well-being, and lower social support can lead to burnout. The reason for this phenomenon may be due to the challenging work environment of seafarer members, which includes dealing with bad weather, ship breakdowns, and so on. If they feel unable to effectively cope with these challenges, this can lead to a decrease in general self-efficacy. In addition, seafarer members' jobs may require them to spend weeks or months on board ships, and long periods on board ships may lead to a work-life imbalance. The lack of this balance may directly lead to a decrease in subjective well-being and psychological resilience. When seafarer members do not receive timely relief from a range of negative emotions arising from their work and do not have substantial or emotional support from family, friends, colleagues, and social organizations, it can lead directly to burnout. Groups 2 and 4 showed that some seafarer members with high subjective well-being, insufficient psychological resilience and social support, or low psychological resilience and general self-efficacy can still lead to burnout. This re-emphasizes the important role of psychological resilience, general self-efficacy, and social support in alleviating burnout. Therefore, it is recommended that companies organize regular seafarer activities and seminars, pay attention to the seafarer's work experience, and create a positive work environment to alleviate burnout.

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